UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,361	10/22/2003	Peter-Pike J. Sloan	3382-66857	9370

26119 7590 10/20/2005

KLARQUIST SPARKMAN LLP
121 S.W. SALMON STREET
SUITE 1600
PORTLAND, OR 97204

EXAMINER	
BROOME, SAID A	
ART UNIT	**PAPER NUMBER**
2671	

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,361	SLOAN ET AL.	
	Examiner	Art Unit	
	Said Broome	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al in view of Morioka et al. (US Patent 6,333,742).

Foley et al. teaches what is disclosed in claims 1-3 except for accumulating the radiance transfer contributions of the points, rendering and presenting the image. Foley et al. teaches creating an object positions texture representing positions of a set of points sampled over the object mapped into a texture space on page 742 where it is described in the second paragraph lines 1-5 that the position of each point is mapped in the texture space. Foley et al. also teaches representing normals of the set of sampled points mapped into the texture space on page 744 section 16.3.3 where it is described that the surface normal of the points are used to map the points into a texture space as known in the art. Foley et al. also describes rendering the object from a direction to produce a shadow buffer representing depth from the object in the direction for the set of points on page 752 second paragraph lines 1-9 where it is described that a buffer which holds the depth information for each pixel, or shadow buffer, is used for each rendered pixel. Foley et al. teaches determining cosine terms, which are terms that describe the cosine of the angle between the light and the normal, of the set of sampled points for the direction

processed based on the surface normals in section 16.1.2 pages 724 second paragraph lines 1-4. Foley et al. teaches the shadowing or occlusion of points based on depth gathered form the shadow buffer and positions of the points on pages 752 lines 3-9 where it is described that the shadow buffer, or z-buffer, has visible-surface determination which determines occlusion of the points to be rendered, which is also illustrated in Figure 16.32. Foley et al. also teaches determining the radiance transfer contribution of the set of sampled points based on the cosine terms and shadowing on page 762 where it is described that radiance, which is the light emitted in a particular direction per unit of projected surface area, is determined for each point based on cosine terms as described on page 761 paragraph 3 line 4 and shadowing is also determined for a set of points and effects the illumination of a point as described on page 752 paragraph 1 lines 1-4 and 10-12. Again, Foley et al. fails to teach accumulating the radiance transfer contributions of the points, rendering an image of the object and presenting the image.

Morioka et al. teaches the accumulation or storing of the radiance values of the set of sampled points for the currently iterated direction with that of the previously iterated directions in column 8 lines 42-46 where it is described that the light emitted in a particular direction from a point on the surface, or the radiance, for each point is calculated in all directions (column 15 lines 10-11) and is stored in the table 80 as illustrated in Figure 19. Morioka et al. also describes rendering the image of the object based on the accumulated radiance value in column 7 lines 11-14, where it is described that the image is rendered by a rendering processor 3(Figure 6) that performs such tasks as shading which includes processing the radiance of the object as described in column 8 lines 63-67 and column 9 lines 1-4. Morioka et al. also teaches presenting the image in column 12 lines 18-20 where it is described that the image is displayed on a monitor

7(Figure 14). Regarding claim 2, Morika et al. teaches a memory for storing program code of at least one pixel shader and a radiance transfer coefficients processing program in column 17 lines 39-47 where it is described that program code, as illustrated in Figure 21, that is known in the art to be stored on a computer readable medium, performs pixel shading in step 7 and processes radiance in step 1 where it is described that the light intensity values are determined. Morioka et al. also teaches a central processing unit operating to execute the radiance transfer coefficients processing program in column 16 lines 10-16 where it is described that the light source information, which includes the radiance value of the pixel, is process by the CPU as illustrated in Figure 16 as element 1. Morioka et al. also teaches a graphics processing unit in column 7 lines 24-33 where it is described that a geometry processor 2 that is illustrated in Figure 6, performs graphics processing and executes at least one pixel shader by a rendering processor as described in column 7 lines 34-38 and is illustrated as element 32 in Figure 6. Morioka et al. teaches the at least one pixel shader executing on a graphics processing unit performing texture operation form each direction sample about the object in column 12 lines 42-51 where it is described that the texture generator, which comprises the rendering processor that performs the same functionality of the disclosed graphics processing unit, performs texture operations for each pixel. The generated data is then sent to the shading circuit, which performs shading, and light intensity operations for each of a set of direction about the object as described in column 9 lines 1-4. Regarding claim 1, Morioka et al. teaches the method of producing radiance coefficients, where the radiance is a value that represents the intensity of light emitted from a point on the surface, for a set of points sampled over a modeled object for rending the object on a computer in column 5 lines 41-52. Regarding claim 2, Morioka et al. teaches the computer system for

hardware accelerated processing in column 5 lines 20-30 and is illustrated in Figure 6. Regarding claim 3, Morioka et al. describes programming code, illustrated in Figure 21, that is stored on a computer being processed by a computer system illustrated in Figure 6 that performs the method of claim 1. It would have been obvious to one of ordinary skill in the art to combine the teachings of Foley et al. with Morioka et al. because this combination would provide radiance transfer values that are determined for points over a surface for a set of directions about the object that would accurately and efficiently display realistic lighting environments and effects in real-time.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Said Broome whose telephone number is (571)272-2931. The examiner can normally be reached Monday-Friday between 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on (571)272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Broome SB
10/13/05

RICHARD HJERPE 10/14/05
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600